

ABSTRACT

The present invention relates to methods and apparatuses for analyzing molecules, particularly polymers, and molecular complexes with extended or rod-like conformations. In particular, the methods and apparatuses are used to identify repetitive information in
5 molecules or molecular ensembles, which is interpreted using an autocorrelation function in order to determine structural information about the molecules. The methods and apparatuses of the invention are used for, *inter alia*, determining the sequence of a nucleic acid, determining the degree of identity of two polymers, determining the spatial separation of specific sites within a polymer, determining the length of a polymer, and determining the
10 velocity with which a molecule penetrates a biological membrane.

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